

What is claimed is:

1. A catalyst for purifying an exhaust gas, comprising:

an upstream side catalyst disposed on an upstream side with respect to an exhaust gas flow and including: a first cylinder-shaped support having a plurality of through holes penetrating therethrough in an axial direction; a first fire resistant inorganic oxide loading layer being formed on inner surfaces demarcating the through holes; and a first catalyst ingredient being held by the first loading layer and being composed of a first noble metal;

a downstream side catalyst disposed on a downstream side with respect to the exhaust gas flow and including: a second cylinder-shaped support having a plurality of through holes penetrating therethrough in an axial direction; a second fire resistant inorganic oxide loading layer being formed on inner surfaces demarcating the through holes; and a second catalyst ingredient being held by the second loading layer and being composed of a second noble metal;

said upstream side catalyst being constituted by the first catalyst ingredient, being composed of at least one member selected from the group consisting of palladium, palladium and rhodium and palladium and platinum as the first noble metal, and the first loading layer, being composed of an alumina containing barium and lanthanum at least; and

said downstream side catalyst being constituted by the second catalyst ingredient, being composed of at least one member selected from the group consisting of platinum, palladium and rhodium as the second noble metal, and the second loading layer, being composed of at

least one member selected from the group consisting of an alumina containing lanthanum, cerium, a solid solution of cerium and zirconium and a solid solution of cerium, zirconium and yttrium.

2. The catalyst for purifying an exhaust gas according to Claim 1, wherein a ratio of the palladium to the barium is  $\text{Pd} : \text{Ba} = 1.0 : 100 - 1.0 : 1.0$  by elemental weight in said upstream side catalyst.

3. The catalyst for purifying an exhaust gas according to Claim 1, wherein a volume ratio of said upstream side catalyst to said downstream side catalyst is said upstream side catalyst : said downstream side catalyst =  $1.0 : 10 - 3.0 : 1.0$ .

4. The catalyst for purifying an exhaust gas according to Claim 1, wherein said upstream side catalyst and said downstream side catalyst are formed on and/or within an identical support.

5. The catalyst for purifying an exhaust gas according to Claim 1, wherein the lanthanum is dissolved in the alumina in the first loading layer of said upstream side catalyst.

6. The catalyst for purifying an exhaust gas according to Claim 1, wherein the barium is dispersed as oxide particles with the alumina in the first loading layer of said upstream side catalyst.

7. The catalyst for purifying an exhaust gas according to Claim 1, wherein the barium is contained in the first loading layer of said upstream side catalyst in an amount of from 1.0 to 100 g by elemental

weight with respect to 1 liter of said upstream side catalyst.

8. The catalyst for purifying an exhaust gas according to Claim 1, wherein the lanthanum is contained in the first loading layer of said upstream side catalyst in an amount of from 0.8 to 8.0 g by elemental weight with respect to 1 liter of said upstream side catalyst.

9. The catalyst for purifying an exhaust gas according to Claim 1, wherein the alumina is an activated alumina.

10. The catalyst for purifying an exhaust gas according to Claim 1, wherein the alumina is included in the first loading layer of said upstream side catalyst in an amount of from 50 to 200 g with respect to 1 liter of said upstream side catalyst.

11. The catalyst for purifying an exhaust gas according to Claim 1, wherein the first catalyst ingredient is composed of the first novel metal in an amount of from 0.01 to 10 g with respect to 1 liter of said upstream side catalyst.

12. The catalyst for purifying an exhaust gas according to Claim 1, wherein the first catalyst ingredient of said upstream side catalyst is composed of the palladium, and the palladium is loaded in the first loading layer in an amount of from 0.01 to 10 g with respect to 1 liter of said upstream side catalyst.

13. The catalyst for purifying an exhaust gas according to Claim

1, wherein the first catalyst ingredient of said upstream side catalyst is composed of the palladium and the rhodium, the palladium is loaded in the first loading layer in an amount of from 0.01 to 5.0 g with respect to 1 liter of said upstream side catalyst, and the rhodium is loaded in the first loading layer in an amount of from 0 to 1.0 g with respect thereto.

14. The catalyst for purifying an exhaust gas according to Claim 1, wherein the first catalyst ingredient of said upstream side catalyst is composed of the palladium and the platinum, the palladium is loaded in the first loading layer in an amount of from 0.01 to 5.0 g with respect to 1 liter of said upstream side catalyst, and the platinum is loaded in the first loading layer in an amount of from 0 to 5.0 g with respect thereto.

15. The catalyst for purifying an exhaust gas according to Claim 1, wherein the first loading layer of said upstream side catalyst is further composed of at least one member selected from the group consisting of cerium, a solid solution of cerium and zirconium and a solid solution of cerium, zirconium and yttrium.

16. The catalyst for purifying an exhaust gas according to Claim 15, wherein an amount of the cerium, contained in the first loading layer of said upstream side catalyst, falls in a range of from 0.01 to 0.1 mol with respect to 1 liter of said upstream side catalyst.

17. The catalyst for purifying an exhaust gas according to Claim 16, wherein an amount of the cerium, contained in the first loading

layer of said upstream side catalyst, falls in a range of from 0.01 to 0.05 mol with respect to 1 liter of said upstream side catalyst.

18. The catalyst for purifying an exhaust gas according to Claim 15, wherein a quantitative ratio of the cerium to the zirconium falls in a range of  $\text{Ce} : \text{Zr} = 2.0 : 1.0 - 1.0 : 2.0$  by elemental weight in the first loading layer of said upstream side catalyst.

19. The catalyst for purifying an exhaust gas according to Claim 15, wherein a quantitative ratio of the cerium to the zirconium as well as to the yttrium falls in a range of  $\text{Ce} : \text{Zr} : \text{Y} = 2.0 : 1.0 : 0.1-0.42 - 1.0 : 2.0 : 0.2-0.84$  by elemental weight in the first loading layer of said upstream side catalyst.

20. The catalyst for purifying an exhaust gas according to Claim 1, wherein the barium is contained in an amount of from 10 to 30 g with respect to 100 g of the alumina in the first loading layer of said upstream side catalyst.

21. The catalyst for purifying an exhaust gas according to Claim 1, wherein the lanthanum is contained in an amount of from 3.0 to 5.0 g with respect to 100 g of the alumina in the first loading layer of said upstream side catalyst.

22. The catalyst for purifying an exhaust gas according to Claim 15, wherein the cerium is contained in an amount of from 0.6 to 2.0 g with respect to 100 g of the alumina in the first loading layer of said upstream side catalyst.

23. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second loading layer of said downstream side catalyst is composed of the lanthanum in an amount of from 0.8 to 4.5 g with respect to 1 liter of said downstream side catalyst.

24. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second loading layer of said downstream side catalyst is composed of the alumina in an amount of from 50 to 250 g with respect to 1 liter of said downstream side catalyst.

25. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second catalyst ingredient of said downstream side catalyst is composed of the second noble metal in an amount of from 0.05 to 10 g with respect to 1 liter of said downstream side catalyst.

26. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second catalyst ingredient of said downstream side catalyst is composed of the platinum in an amount of from 0.05 to 1.0 g with respect to 1 liter of said downstream side catalyst and the palladium in an amount of from 0.05 to 2.0 g with respect thereto.

27. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second catalyst ingredient of said downstream side catalyst is composed of the platinum in an amount of from 0.05 to 1.0 g with respect to 1 liter of said downstream side catalyst and the rhodium in an amount of from 0.05 to 0.3 g with respect thereto.

28. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second catalyst ingredient of said downstream side catalyst is composed of the palladium in an amount of from 0.05 to 2.0 g with respect to 1 liter of said downstream side catalyst and the rhodium in an amount of from 0.05 to 0.3 g with respect thereto.

29. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second catalyst ingredient of said downstream side catalyst is composed of the platinum in an amount of from 0.05 to 1.0 g with respect to 1 liter of said downstream side catalyst, the palladium in an amount of from 0.05 to 2.0 g with respect thereto and the rhodium in an amount of from 0.05 to 0.3 g thereto.

30. The catalyst for purifying an exhaust gas according to Claim 1, wherein the lanthanum is contained in an amount of from 3.0 to 5.0 g with respect to 100 g of the alumina in the second loading layer of said downstream side catalyst.

31. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second loading layer of said downstream side catalyst is composed of the cerium in an amount of from 0.2 to 0.8 mol with respect to 1 liter of said downstream side catalyst.

32. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second loading layer of said downstream catalyst is composed of the solid solution of the cerium and the zirconium, and a ratio of the cerium to the zirconium falls in a range of  $Ce : Zr = 2.0 : 1.0 - 1.0 : 2.0$  by elemental weight.

33. The catalyst for purifying an exhaust gas according to Claim 1, wherein the second loading layer of said downstream side catalyst is composed of the solid solution of the cerium, the zirconium and the yttrium, and a ratio of the zirconium to the yttrium falls in a range of  $Zr : Y = 10 : 1.0 - 7.0 : 3.0$  by elemental weight.